noxæ, determines its usefulness for studying the diseases of the circulation.

In the experiments of the above-cited authors, the observations were made upon the venous segments of the anastomosis. Here although in only some of the animals the vein was noted to be dilated, it is concluded that an increased blood pressure existed in all. It is not at all clear to what extent the blood pressure was increased when the external carotid and external jugular were united. With the free anastomosis which exists (varying much in individual animals), between the venous channels of the neck, it is possible that an increase of pressure exists for only a short period after the successful anastomosis.[2]

It is further to be pointed out that various observers have recorded that periodic and intermittently increased blood pressures have quite a different effect upon the blood vessels than a constant and continuous one. The periodically increased pressure is found commonly in man, and if we may draw any conclusions from the finding of occupation sclerosis (right radial sclerosis in the blacksmith, femoral sclerosis in the policeman), it is that the periodic increase of pressure leads to degenerations and sclerosis in the arteries.

Finally, but of primary importance, the results of observations on veins can not be utilized in drawing conclusions about arteries, as has been done by Levin and Larkin.

Oscar Klotz

University of Pittsburgh,
February, 1911

Presence of Arsenic in Fruit Sprayed with Arsenate of Lead

The spraying of fruits with an arsenical has been practised for a number of years in the control of insects which destroy by eating. The form in which arsenic was first used was Paris green, which, however, proved, for the most part, to be more or less injurious to foliage and fruit on account of the soluble character of the compound. Only within recent years has arsenate of lead come into use. The main reasons for its use as recommended by entomologists was its greater purity and insolubility in water. During the past three years the writer has had occasion to question the use of arsenate of lead as commonly found on the market. Many brands do not show sufficient uniformity in arsenic content, nor is the arsenic found in the proper combination with the lead. When lead nitrate and disodium arsenate or lead acetate and disodium arsenate are combined at least three forms of arsenate of lead may result, namely, ortho-arsenate of lead ($Pb_3(AsO_4)_2$), pyro-arsenate of lead ($Pb_2As_2O_7$) and meta-arsenate of lead ($(PbHAsO_4)_2$). The last named compound is very injurious to foliage and fruit under certain climatic influences; and the pyro-arsenate of lead may become so in the presence of water containing soluble chlorides, sulphates or carbonates. Very few of the waters commonly used to apply arsenate of lead are pure, hence injury may result, although the compound if used with chemically pure water will produce no injury. The ortho-arsenate of lead, however, is practically insoluble in neutral and alkaline solvents.

Besides any apparent injury, such as the spotting or burning of the fruit and foliage, a certain amount of arsenic may be absorbed by the fruit without showing any injury at the time. The occurrence of certain spots on apples held in storage has occupied the attention of the writer for some time. Upon examination, such fruits were found to contain appreciable quantities of arsenic. The badly red-spotted and black-spotted fruits showed approximately twice as much arsenic as fruits from the same lot which showed no spotting. A ten-gram sample of badly spotted apple skin showed 0.05 of a milligram of metallic arsenic. One large Spitzenburg apple showed a total of 0.3 milligram of arsenic calculated as As_2O_5. The fruits were carefully washed so as to exclude from analysis all arsenic that adhered to the surface.

It has also been noted by the writer that certain papers used to wrap apples and pears, a practise common on the Pacific coast, con-

[2] See Carrel and Guthrie, "Surg. Gynac. and Obstet.," 1906, Vol. II.; and Watts, *Bull. Johns Hopkins Hosp.*, 1907, Vol. XVIII.

tain, very frequently, small amounts of arsenic, as well as other substances which may or may not have an injurious effect. It is quite well known that small quantities of arsenic have a tendency to hasten the ripening process in fruits. One instance of particular interest has been noted. A certain shipment of pears was wrapped with two different brands of paper. The pears were of one variety, all from one orchard, and were kept under exactly the same conditions and treated in every way the same, excepting that about one half of the shipment was wrapped with one brand of paper and the rest with another brand. After the fruit had been in storage for some time it was found that the ripening process in one lot was much in advance of the other; the other lot remained normal. After an examination of the whole shipment it was found that the condition of the fruit corresponded exactly with the brand of paper used. It would seem from this that fruit growers should pay particular attention to the quality of paper used for wrapping fruit as well as the quality of arsenate of lead used in spraying the fruit.

P. J. O'GARA

THE AMERICAN PHILOSOPHICAL SOCIETY

THE annual general meeting of the society was held in the hall of the society, Philadelphia, April 20, 21 and 22, at which about sixty papers were presented on scientific and literary topics.

President W. W. Keen, LL.D., and Vice-president E. C. Pickering took turns in presiding at the various sessions.

It has been the custom for several years to devote one half-day session to a symposium on some special topic in science. This year the subject was "Modern Views of Matter and Electricity," and the following papers bearing on this general topic were offered: "The Fundamental Principles," by Professor D. F. Comstock, of Boston; "Radioactivity," by Professor B. B. Boltwood, of New Haven; "Thermionics," by Professor O. W. Richardson, of Princeton; "The Constitution of the Atom," by Professor H. A. Wilson, of Montreal. The general conclusion seems to be that the atom of matter, groups of which compose the molecules of different substances, is built up of much smaller parts, known as electrons, identical with the smallest unit of negative electricity. Sir J. J. Thomson's theory of the atom assumes also a spherical form of positive electricity, throughout which are imbedded the electrons in different numbers according to the kind of atom. It was also explained how it is possible to estimate the actual number of electrons in an atom of any given kind. As the inertia of an electron emitted from the atom of a radioactive substance, such as radium, has been experimentally proved to be a function of its speed, the evidence is strong that all inertia or mass may be electrodynamic in its nature.

At the opening session on Thursday the following papers were read:

Notes on Cannon: Fourteenth and Fifteenth Centuries: CHARLES E. DANA, Philadelphia.

The first absolutely reliable, contemporaneous account we have of cannon is contained in an edict, still to be seen, in Florence, Tuscany, dated 1326. What these cannon looked like or did we shall never know, but with them begins the authentic history of ordnance; back of them is only legend.

Powder was in those early days, as its name implies, a dust; it contained the charcoal and sulphur of to-day, as well as the saltpeter, but far too small a quantity of the last, on account of the difficulty in procuring it. The cost, in the middle of the fourteenth century, was almost prohibitive, cheap at twenty-five dollars a pound, in money of to-day.

The next mention of cannon is of some at the Tower of London in 1338; amongst these were several breech-loaders. Another, in the same year, called a "pot for hurling arrows," was the pride of the arsenal of Rouen, France. The charge for this mighty engine of war was less than an ounce of the badly proportioned dust of that day—termed powder.

It is often asserted that three field-guns were used by the English at Crécy, where, in 1346, they gained so tremendous a victory. One must always remember that a large body of English archers was there present. Every man of them was a dead-shot, firing ten or more arrows a minute from his "longbow"; the effective range was two hundred and fifty yards, every "cloth-yard arrow" was an armor-piercing projectile. Of what use three absurd pop-guns would have been it is difficult to imagine. The interest is purely antiquarian, as these would have been the first field-artillery mentioned in history. That cannon were